IN THE CLAIMS:

1. (Original) A method of treating a volume of plastics waste, including:

providing a volume of plastics waste comprising one or more plastics types, the or each of the plastics types having a melting point and a flash point;

providing a heating zone having an entry zone through which the volume of plastics waste is feedable and an outlet downstream of the entry zone relative to the direction of flow of plastics waste;

bringing the heating zone to a predetermined operating temperature, the operating temperature being selected so as to be less than the flash point of the one or more plastics types to avoid causing carbonisation of the plastics waste;

allowing the volume of plastics waste to fall from the entry zone into the heating zone under the influence of gravity;

heating the volume of plastics waste in the heating zone to a temperature at which at least some of the volume of plastics waste is melted to form a flowable plastics melt including molten and non-molten plastics waste wherein the molten plastics waste encapsulates and supports the non-molten plastics waste and sterilises any contaminants included therein;

causing the flowable plastics melt to flow from the heating zone to the outlet under the influence of gravity.

2-34. (Canceled)

35. (New) A method as claimed in claim 1, further including creating a non-uniform thermal surface in the region where the entry zone leads into the heating zone to facilitate the flow of plastics waste from the entry zone into the heating zone.

36. (New) A method as claimed in claim 35, wherein the non-uniform thermal surface is created by providing a plurality of heating members which extend transversely to the flow of plastics waste and which have tapered leading edges

terminating at different heights in the region where the entry zone leads into the heating zone.

37. (New) A method as claimed in claim 1, further including allowing the flowable plastics melt to flow into a cooling zone during which gas is allowed to escape to facilitate the flow of the plastics melt and causing the flowable plastics melt to solidify.

38. (New) A method as claimed in claim 37, wherein the flowable plastics melt is formed into sterile, shaped and stackable solidified bodies of plastics waste in the cooling zone.

39. (New) A method as claimed in claim 1, further including fragmenting the plastics waste prior to the plastics waste entering the heating zone.

40. (New) A method as claimed in claim 39, wherein fragmenting the plastics waste occurs within the entry zone.

41. (New) A method as claimed in claim 1, further including filtering fumes released when the plastics waste is heated by utilising atmospheric pressure non-equilibrium plasma technology.

42. (New) A method of treating a volume of plastics waste, including:

providing a volume of plastics waste comprising one or more plastics types, the or each of the plastics types having a melting point and a flash point;

providing a heating zone having an entry zone through which the volume of plastics waste is feedable and an outlet downstream of the entry zone relative to the direction of flow of plastics waste;

bringing the heating zone to a predetermined operating temperature, the operating temperature being selected so as to be less than the flash point of the one or more plastics types to avoid causing carbonisation of plastics waste;

allowing the volume of plastics waste to fall from the entry zone into the heating zone under the influence of gravity;

heating the volume of plastics waste in the heating zone to a temperature at which at least some of the volume of plastics waste is melted to form a flowable plastics melt;

causing the flowable plastics melt to flow through the outlet under the influence of gravity and into a cooling zone during which gas is allowed to escape to facilitate the flow;

causing the flowable plastics melt in the cooling zone to solidify.

43. (New) A method as claimed in claim 42, further including creating a non-uniform thermal surface in the region where the entry zone leads into the heating zone to facilitate the flow of plastics waste from the entry zone into the heating zone.

44. (New) A method as claimed in claim 43, wherein the non-uniform thermal surface is created by providing a plurality of heating members which extend transversely to the flow of plastics waste and which have tapered leading edges terminating at different heights in the region where the entry zone leads into the heating zone.

45. (New) A method as claimed in claim 42, wherein the flowable plastics melt is formed into sterile, shaped and stackable solidified bodies of plastics waste in the cooling zone.

46. (New) A method as claimed in claim 42, further including fragmenting the plastics waste prior to the plastics waste entering the heating zone.

47. (New) A method as claimed in claim 46, wherein fragmenting the plastics waste occurs within the entry zone.

48. (New) A method as claimed in claim 42, further including filtering fumes released when the plastics waste is heated by utilising atmospheric pressure non-equilibrium plasma technology.

49. (New) A method of treating a volume of plastics waste, including:

providing a volume of plastics waste comprising one or more plastics types, the or each of the plastics types having a melting point and a flash point;

providing a heating zone having an entry zone into which the volume of plastics waste is feedable and an outlet downstream of the inlet relative to the direction of flow of plastics waste;

bringing the heating zone to a predetermined operating temperature, the operating temperature being selected so as to be less than the flash point of the one or more plastics types to avoid causing carbonisation of plastics waste;

allowing the volume of plastics waste to fall from the entry zone into the heating zone under the influence of gravity;

creating a non-uniform thermal surface in the region where the entry zone leads into the heating zone to facilitate the flow of plastics waste from the entry zone into the heating zone;

heating the plastics waste in the heating zone to a temperature at which at least some of the volume of plastics waste is melted to form a flowable plastics melt;

causing the flowable plastics melt to flow from the heating zone to the outlet under the influence of gravity.

50. (New) A method as claimed in claim 49, wherein the non-uniform thermal surface is created by providing a plurality of heating members which extend transversely to the flow of plastics waste and which have tapered leading edges terminating at different heights in the region where the entry zone leads into the heating zone.

51. (New) A method as claimed in claim 49, further including allowing the flowable plastics melt to flow into a cooling zone during which gas is allowed to escape to facilitate the flow of the plastics melt and causing the flowable plastics melt to solidify.

52. (New) A method as claimed in claim 51, wherein the flowable plastics melt is formed into sterile, shaped and stackable solidified bodies of plastics waste in the cooling zone.

53. (New) A method as claimed in claim 49, further including fragmenting the plastics waste prior to the plastics waste entering the heating zone.

54. (New) A method as claimed in claim 53, wherein fragmenting the plastics waste occurs within the entry zone.

55. (New) A method as claimed in claim 49, further including filtering fumes released when the plastics waste is heated by utilising atmospheric pressure non-equilibrium plasma technology.

56. (New) An apparatus for treating a volume of plastics waste, the apparatus including:

a melt chamber having an inlet and an outlet downstream of the inlet, the melt chamber defining a heating zone for receiving and heating a volume of plastics waste;

a heating arrangement for bringing the temperature of the melt chamber to a pre-determined level and for heating the volume of plastics waste to a temperature at which at least some of the volume of plastics waste is melted to form a flowable plastics melt;

a cooling chamber arrangement disposed downstream of the melt chamber outlet and defining a cooling zone for receiving and cooling the flowable plastics melt; and

means defining a vent for permitting gas to escape from the melt chamber during the flow of the flowable plastics melt from the heating zone into the cooling zone.

57. (New) An apparatus as claimed in claim 56, wherein the vent is constituted by a gap disposed between the melt chamber and the cooling chamber means.

58. (New) An apparatus as claimed in claim 57, wherein the gap has a width in the range of 0.4 to 2.5 mm.

59. (New) An apparatus as claimed in claim 56, the cooling chamber arrangement being defined by at least one mould cavity for forming a solidified body of plastics waste.

60. (New) An apparatus as claimed in claim 56, further including an arrangement for fragmenting the plastics waste prior to the plastics waste entering the melt chamber.

61. (New) An apparatus as claimed in claim 60, wherein the fragmenting arrangement is disposed upstream of the melt chamber inlet.

62. (New) An apparatus for treating a volume of plastics waste, the apparatus including:

a melt chamber having an inlet and an outlet downstream of the inlet, the melt chamber defining a heating zone for receiving and heating a volume of plastics waste;

a heating arrangement for bringing the temperature of the melt chamber to a pre-determined level and for heating the volume of plastics waste to a temperature at which at least some of the volume of plastics waste is melted to form a flowable plastics melt;

wherein the heating arrangement includes a plurality of heating members which extend transversely to the flow of plastics waste and which are arranged to create a non-uniform thermal surface in the region of the melt chamber inlet.

63. (New) An apparatus as claimed in claim 62, wherein the heating members are constituted by fins having a leading edge near the inlet of the melt chamber and a trailing edge near the outlet of the melt chamber.

64. (New) An apparatus as claimed in claim 63, wherein the leading edges of alternate heating members terminate at different upstream locations relative to the leading edges of adjacent heating members to provide a non-uniform thermal surface.

65. (New) An apparatus as claimed in claim 62, wherein the melt chamber has oppositely facing side walls and wherein the heating members extend between and are removably supported by the side walls.

66. (New) An apparatus as claimed in claim 62, wherein the heating members have at least one electrical resistive heating element embedded therein.

67. (New) An apparatus as claimed in claim 62, further including a cooling chamber disposed downstream of the melt chamber outlet and defining a cooling zone for receiving and cooling the flowable plastics melt.

68. (New) An apparatus as claimed in claim 67, the cooling chamber being defined by at least one mould cavity for forming a solidified body of plastics waste.

69. (New) An apparatus as claimed in claim 68, wherein the or each mould cavity is of discoidal form having dimensions selected to enable a drinks can to be encapsulated by the solidified body of plastics waste in the mould cavity.

70. (New) An apparatus as claimed in claim 62, further including an arrangement for fragmenting the plastics waste prior to the plastics waste entering the melt chamber.

71. (New) An apparatus as claimed in claim 70, wherein the fragmenting arrangement is disposed upstream of the melt chamber inlet.